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Apparatus for metering and mixing cosmetic products

The invention concerns an apparatus for metering and mixing cosmetic products, in which the various components of a cosmetic product are introduced into a common stirring vessel via various discharge fittings and are mixed in the common stirring vessel to produce the end product.

Known apparatuses of this type are used as filling stations for single, mass-produced products. In these known apparatuses, the individual components are introduced into a supply reservoir that holds the required quantity and that is completely emptied into the stirring vessel.

The goal of the invention is to provide an apparatus of the type specified above, with which the retailer can, according to the wishes of the customer, selectively mix specific components of a cosmetic product in variable proportions. This is particularly applicable to the metered addition of perfume oils and active substances in which the quantity of the so-called base (= carrier for active substances), for example, in the form of an emulsion, gel, or aqueous solution, is adjusted to the specific packaging container employed.

The aforesaid goal is achieved in accordance with the invention by setting up a support wall that carries a plural number of individual discharge fittings for the bases and for the active substances, with which individual handles are associated for the purpose of conveying metered quantities from stock containers arranged on the back side of the support wall.

This arrangement makes possible the facile introduction of the desired individual quantities directly into a packaging container or stirring vessel by operating the handles in accordance with the wishes of the customer while the customer watches. Since the ratio of the quantities of base to the quantities of active substances is approximately 1000 : 1 to 1000 : 2, no restrictions are placed on the quantity of addition of active substances by the capacity of the stirring vessel or the packaging container.

Another advantage of the arrangement in accordance with the invention is that the customer can sample and test the effects of a mixture on the spot, with the result that the mixture can be completely tailored to individual customer tastes.

As necessary in individual cases, the support wall can have relatively large dimensions; thus, for example, a support wall can be produced that has twelve discharge fittings for bases and fifty small discharge fittings for active substances.

In a particularly advantageous embodiment, each stock container held on the back side of the support wall takes the form of a cartridge whose one end is connected to a discharge fitting on the front side of the support wall and whose other end is acted on by a piston that can be displaced in the interior of the cartridge in order to extrude the component contained in the cartridge through the discharge fitting. The

handles are advantageously placed above the discharge fittings: this allows them to fit on the support wall while economizing on space and also supports operation of the discharge fitting free from interference with the feed to the stirring vessel or packaging container.

In order to prevent dripping from the discharge fittings, particularly in the case of thinly liquid components, a check valve is advantageously placed between the stock container and the discharge fitting. This check valve is advantageously located as close as possible to the discharge fitting.

In the case of a check valve-equipped embodiment, the stock containers or cartridges can be placed on the support wall with their bottom ends (facing the pistons) pointing upward and their delivery ends pointing downward. This makes possible a particularly simple actuation of the piston via intermediate linkage elements using the handle above the discharge fitting.

Another embodiment consists of attaching the stock container to the support wall with its piston end pointing downward and its delivery end pointing upward. If in this case the discharge conduit is attached to the support wall in an ascending and inclined manner, its free end carrying the discharge opening will then reside above its middle section and above the delivery end of the stock container. As a result, the component being delivered will not be able to exit after completion of the process of delivery from the discharge opening. However, in order for the handle to remain above the discharge fitting as described above, this set up also requires that the handle linkage elements ascend upward past the cartridge.

To achieve the aforementioned goal, it will be advantageous to rotatably attach the discharge fitting, which is advantageously designed as

an elbow piece, to the support wall or to its feed conduit so that the downward-pointing discharge end can be turned upward when the delivery process is completed.

Another advantageous specific embodiment of this metering apparatus consists of providing each component with a special movable piston-equipped metering cylinder whose delivery end (below the piston) is connected to the discharge fitting and stock container. In this configuration, the component to be delivered is suctioned from the stock container into the metering cylinder by a stroke of the metering cylinder piston in one direction and is delivered through the discharge fitting by a stroke of the piston in the opposite direction.

In this configuration, check valves are advantageously provided in the feed conduits from the stock container, on the one hand, and to the discharge fitting, on the other hand; these valves close the discharge fitting during the suction stroke of the piston and close the feed conduit from the stock container during the compression stroke of the piston.

Like the stock container, this metering cylinder can be placed on the back side of the support wall and linkage elements can provide the connection between the piston and a handle for operating the metering cylinder. It is also possible to place the metering cylinder on the front side of the support wall.

In order to be able to simply connect the stock container (typically equipped with a threaded open end) to the feed conduit to the metering cylinder without spillage, a swivel joint is advantageously provided between the feed conduit to the metering cylinder and a connecting adapter for the stock container. This permits the stock container's connecting adapter to swivel by 180°, thus enabling the stock container to be screwed into the connecting adapter with its opening

facing up. After the stock container has been screwed in, the swivelable tube can be swiveled so as to place the stock container with its opening downward and vertically above the swivelable tube. The corresponding connections can also be provided for cartridges.

Compared to the use of cartridges, this metering cylinder embodiment has the advantage that it enables the use of very simple stock containers, for example, even cream cans or the like. Only their lid connection need be adapted to the mounting connections of the swivelable tube, possibly via intermediate connections. In this way, the apparatus in accordance with the invention may be loaded using any known supply container available on the market.

Since a constant quantity of base (predetermined by the particular packaging container) is delivered in each case and since the quantities of active substances to be added are relatively small, it is possible and advantageous in each case to assign a constant delivery quantity to a single handle stroke.

It is also possible with this arrangement to limit the stroke movement of the handle and thus the stroke movement of the metering cylinder piston and the delivery quantity in a simple manner by means of a bolt-shaped stop pin, which can be adjusted to a particular height in relation to the handle.

In this specific embodiment the handle can be placed on a pivotable arm that is connected through an intermediate lever to the upper end of the piston rod in the metering cylinder. The rear free end of this arm can at the same time function as a trigger to actuate a limit switch for a totalizer or a computer (vide infra).

Another specific embodiment for quantitative metering consists of a stepping mechanism that moves the piston along in steps by specific

constant displacements in response to pressure on the handle. This stepping mechanism can be designed as a rack with a ratchet wherein the rack is an extension of the piston rod. The stop pin described above can also be step-controlled in a corresponding manner.

The linkage elements between the handle and the piston at the bottom end of a cartridge can also be designed as a toggle joint mechanism with which the stepping mechanism is associated. It is also possible for this purpose to install a servomotor that can be electrically triggered by the handle. In this case, the duration of servomotor operation and thus the piston stroke can be adjusted — in order thereby to change the delivery quantity — by means of a time switch mechanism housed, for example, in the computer. Hydraulic and/or pneumatic piston actuation is also possible.

It will also be advantageous to assign a constant price to a constant quantity for each component. In order to be able to record the corresponding total price that is generated by the various mixing proportions, it will be advantageous to install a totalizer display-equipped computer that is driven by individual pulses wherein each individual pulse is assigned a particular, preselectable price. The price is assigned to the individual pulse by means of an adjustment device that is associated with each individual cartridge. Preselection can be done electrically or electronically. Various prices can thus be assigned by preselection with the result that different values can be input to the totalizer by the same pulse. Fixed steps are preferably used for price preselection. Each individual stock container has a corresponding preselector and corresponding pulse input to the computer, and the preselectors — equipped with scales in units of monetary currency — are preferably placed on the back side of the support wall.

Pulse input is advantageously carried out through the presence of a contact, for example, in the form of a limit switch, which can be acted upon at the end of the stroke of the handle or of a linkage element connected with the handle.

Through the action of the contact or limit switch, therefore, pulses associated with the individual stock containers are input to the computer through the preselectors.

A work table is advantageously attached to the support wall provided in accordance with the invention. This work table can be designed as lower shelving to hold additional packaging containers and/or stock containers.

A rear cabinet containing other supply compartments is also advantageously adjoined to the back side of the support wall. This rear cabinet may be accessed from the rear or from the side. This rear cabinet can thus be designed as an enclosed, walk-in closet that is provided with a side door through which the closet can be entered. In particular, shelving can be set up on its side wall, and, if the width of the closet permits, shelving can be provided on the back side of the closet. Additional shelving may advantageously be placed below the stock containers. Suitable drawers with sliding doors can be installed instead of shelving.

In order to adapt to the space conditions prevailing in individual retail stores, the side walls can be executed in various widths and these various widths can be kept in stock in order to be able to accommodate individual needs when delivering the entire cabinet. Given these variable wall distances, the shelving on the inside of the back wall of the cabinet may be omitted as necessary.

The invention is explained in greater detail below with the aid of the exemplary embodiments in the drawings.

Figure 1 contains a perspective representation of a specific embodiment of the apparatus in accordance with the invention.

Figure 2 contains a perspective representation of the back wall of the apparatus according to Figure 1.

Figure 3 contains another specific embodiment of the apparatus according to Figure 1.

Figure 4 contains a schematic representation of a specific embodiment for actuating the delivery mechanism.

Figure 5 contains a schematic representation of another specific embodiment for actuating the mechanism.

Figure 6 contains another specific embodiment.

Figure 7 contains a schematic circuit diagram for inputting preselected values to a totalizer and computer.

Figure 8 is a circuit diagram similar to Figure 7 with a somewhat modified specific embodiment.

In accordance with Figure 1, a plural number of discharge fittings 2 are placed on a support wall 1, and each of these is associated with a handle 3 by means of which metered quantities can be conveyed from the supply containers 4 (see Figure 2) placed on the back side of the support wall 1. In the specific embodiment depicted, the support wall 1 is attached to a work table 5, and this work table is designed as lower shelving to hold more packaging containers and/or stock containers. The individual discharge fittings 2 can be specifically paired with a packaging container or a stirring vessel 6 by setting the particular receiving vessel on the work table 5 beneath the discharge fittings 2.

The display panel 7 of a totalizer or computer 8 (see Figure 2) is placed on the support wall 1 in accordance with Figure 1, and the computer 8, as can be seen in Figure 2, is advantageously placed on the

back side of the support wall 1. The display panel can be used, for example, to display the total price to the customer. In order to keep the stock containers 4 arranged on the back side of the support wall 1 from bumping against the room wall and in order to provide a clean view of the support wall, a cover 9 surrounding the stock containers is advantageously placed on the back side of the support wall 1.

Figure 2 shows the back side of the apparatus according to Figure 1 and shows the attachment of stock containers 4 to the back side of the support wall 1, for example, with clamps 10; these stock containers 4 can be cartridges, as are already known, in which a piston can move vertically in the manner described below. Linkage elements 11 lead to the handles 3 on the front side of the support wall 1. In the exemplary embodiment depicted, the delivery end 12 of the stock container 4 points downward, and connecting conduits 13, which are connected to the delivery ends 12, lead to the discharge fittings 2 arranged on the front side of the support wall 1.

Figure 3 contains a specific embodiment in which a rear cabinet 15 is attached to the back side of the support wall 1. This rear cabinet can be entered through a side door 14 and contains additional supply compartments or shelves 16. In the depicted exemplary embodiment, the shelving 16 is placed on a side wall and on the back wall. The boards of the shelving 16 on the back wall 17 of the rear cabinet may be omitted in order to reduce the footprint of the overall apparatus as necessary. As a modification of the specific embodiment depicted in Figure 3, the rear cabinet can be designed to be narrower and thus accessible only by reaching in from the side or by moving it away from the room wall.

Figure 4 contains a schematic representation of a specific embodiment for actuating a piston 18 in a cartridge-type stock container 4

that is attached to the support wall 1 with its delivery end 12 pointing downward. The linkage elements 11 that form the connection between the handle 3 and the piston 18 are designed as two double toggle joints 19, which can pivot at 20 around a fixed point and at 21 are connected with one another in an articulated manner. With movement of the lever 3 downward in the direction of the arrow 3a, the hinge 21 moves upward and the free end of the toggle joint 19 remote from the handle 3 also moves downward like the handle 3. The free end of this toggle joint can be connected in an articulated manner with the piston rod 22 of the piston 18 so that a specific stroke of the piston 18 is associated with a specific stroke of the handle 3. However, in order to avoid having to empty the entire stock container 4 with a single stroke of the handle 3, a step mechanism can be interposed between the linkage elements 11 and the piston rod 22, which consists of a rack 23 in the exemplary embodiment depicted. This rack engages a ratchet 24 on the free end of the toggle joint 19. As the handle 3 is moved back (opposite the direction of arrow 3a), for example, through the action of a spring, the free end of the toggle joint 19 will therefore be moved upward and is stepped up by one or more teeth on the rack 23, thus setting up a new downward stroke of the piston 18. Appropriate adjustment devices can be installed in order to adjust the delivery quantity corresponding to the individual piston stroke.

In order to prevent dripping, particularly in the case of thinly liquid components, check valves 25 can be placed in the connecting conduit 13 and also in the discharge fitting.

Figure 5 contains a schematic representation of another embodiment of the linkage elements 11, in which in this case the stock container 4 is arranged on the support wall 1 with its delivery opening 12 pointing upward. The piston rod 22 of the piston 18 is connected in an

articulated manner with a double toggle joint 26, which is hingewise mounted at a stationary point at 27. The free end of the double toggle joint 26 is connected to a connecting rod 28 in an articulated manner; the upper free end of this rod is, in turn, connected in an articulated manner to the free end of another double toggle joint 29, which is also hingewise mounted at a stationary point at 30. Handle 3 is carried on the end of the toggle joint 29 running to the support wall 1 and passing through it. As the handle 3 is moved downward in the direction of the arrow 31, the connecting rod 28 and thus the piston 18 are moved upward as a result. The magnitude of the stroke depends on the individual linkage distances.

As can be seen from Figure 5, the discharge conduit 32 connected to the delivery end 12 of the stock container 4 is attached to the support wall 1 in an ascending and inclined manner so its free end with discharge opening 33 lies above the middle section of the discharge conduit 32 and above the delivery opening of the stock container 4. In this way, the delivered components will no longer exit when the process of delivery from the discharge opening 33 has been completed. However, this embodiment does require that the linkage elements 11 be installed, as depicted, in such a manner that they ascend upward past the stock container 4 in order that handle 3 can remain above the discharge fitting.

Rotatable discharge fittings can be used. In order also to avoid dripping beyond the check valve 25 in Figure 4, the discharge fitting 2, designed as an elbow piece according to Figure 4, can be rotatably attached to the support wall 1 or the connecting conduit 13 in order that the downward-pointing delivery end can be turned upward after the delivery process has been completed.

Figure 6 contains another specific embodiment, in which a piston 35-equipped metering cylinder 34 is provided for each individual

component. The lower end 36 of this metering cylinder is connected to the discharge fitting 2 and to the stock container 4 placed on the back side of the support wall 1 via a connecting conduit 37. The stock container 4 thus is not designed as a piston-equipped cartridge in this specific embodiment, but rather can be an ordinary stock container, which may be open only at the bottom, depending on the consistency of the component to be delivered, and which can be equipped with a free-floating plug 38.

The component to be delivered is suctioned into the metering cylinder 34 from the stock container 4 by an upward stroke of the piston 35 in the metering cylinder 34 in the direction of the arrow 39, and is delivered through the discharge fitting 2 by a stroke movement of the piston 35 in the direction opposite to the arrow 39. Check valves 40 and 41 are provided in support of this operation — in the feed conduit 37 to the stock container 38 and in the feed conduit to the discharge fitting 2. These valves close the discharge fitting 2 during the suction stroke of the piston 35 and close the feed conduit 37 to the stock container 4 during the compression stroke of the piston 35.

In the specific embodiment according to Figure 6, the handle 2 [sic, 3?] consists of an arm 43 that can pivot at 42 on the support wall 1 and that is connected via an intermediate lever 44 to the upper end 45a of the piston rod 45 in the metering cylinder 34. The free end 43a of the arm 43 projecting beyond the stationary bearing 42 can simultaneously function to actuate a limit switch 46 or the like in order to trigger the totalizer or computer 8 (see Figure 2).

The articulation point 21 in Figure 4 can similarly be used to trigger a limit switch depicted there schematically also as 46.

In order to be able to simply connect the stock container 4 (ordinarily threaded at its open end) to the feed conduit 37 leading to the

metering cylinder 34 without spillage, a swivel joint 47 is provided between the feed conduit 37 and a connecting adapter 48 for the stock container 4. This swivel joint 47 enables swiveling of the connecting adapter 48 by 180° in order that stock container 4 may first be screwed into the connecting adapter 48 with its opening facing upward. After screwing in, the swivelable tube 47 is swiveled to bring the supply container into the position depicted in Figure 6. Appropriately designed adapters may be used when the stock container consists of a cream can or the like that has a relatively wide threaded connection for a lid or the like.

Figure 6 also shows a bolt-shaped stop pin 49, which can be adjusted by screwing into a holder 50 equipped with female threading. This bolt-shaped stop pin limits the suction stroke of the piston 35 and thus functions as a quantitative metering device.

Figure 7 contains a schematic circuit diagram for the preselection of a particular price for the component delivery quantity that generates an individual pulse, for example, by the actuation of limit switch 46. This assignment can be accomplished by means of an adjustment device 51 (see also Figure 2), with an adjustment device 51 being associated with each stock container 4. Preselection can be carried out, for example, through an adjustable resistance or voltage divider or electronically. In response to the trigger from limit switch 46, the preselected value is transmitted to a computer 52, and the total price resulting from the individual delivery quantities is displayed on totalizer 53. The arrangement according to Figure 8 differs from the preceding only by the use of a stepped stage-selector switch 55, which is adapted to the applicable monetary currency, instead of continuous price preselection.

The scales 54 (see Figure 2) on the preselectors 51 are advantageously calibrated in the appropriate units of monetary currency.

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Claims

1. Apparatus for metering and mixing cosmetic products, in which the various components of a cosmetic product are brought into a common stirring vessel via various discharge fittings and are there mixed to produce the end product, characterized in that a support wall (1) is set up, on which there are located a plural number of discharge fittings (2) for the bases and for the active substances of the cosmetic products, with which individual handles (3) are associated for conveying metered quantities from stock containers (4) placed on the back side of the support wall (1).
2. Apparatus according to Claim 1, characterized in that a relatively large number of discharge fittings (2) are arranged on the support wall (1), preferably twelve discharge fittings for the bases and fifty small discharge fittings for the active substances.
3. Apparatus according to Claims 1 or 2, characterized in that the back side of the support wall carries cartridge-type stock containers (4),

which are connected at one end (12) to the discharge fittings (2) on the front side of the support wall (1), and whose opposite ends are acted upon by pistons (18) which move in the interior of the cartridges and thereby extrude the components contained in the cartridges (4) through the discharge fittings (2).

4. Apparatus according to one of the preceding claims, characterized in that the handles (3) are positioned above the discharge fittings (2).
5. Apparatus according to one of the preceding claims, characterized in that at least one check valve (25) is placed between the stock container (4) and the discharge fitting (2).
6. Apparatus according to Claim 5, characterized in that the stock containers (4) are placed on the support wall (1) with their delivery ends (12) pointing downward.
7. Apparatus according to one of Claims 1 through 4, characterized in that the stock container (4) is placed on the support wall (1) with its delivery end (12) pointing downward.
8. Apparatus according to Claim 7, characterized in that the discharge conduit (32) is attached to the support wall (1) in an ascending and inclined manner so its free end with the discharge opening (33) lies above the middle section of the discharge conduit (32) and above the delivery end (12) of the stock container (4).
9. Apparatus according to one of the preceding claims, characterized in

that the discharge fitting (2) is rotatably installed on the support wall (1) or on its feed conduit (13).

10. Apparatus according to Claim 9, characterized in that the discharge fitting (2) is designed as an elbow piece.
11. Apparatus according to one of the preceding claims, characterized in that a special metering cylinder (34) equipped with a movable piston (35) is provided for each of the individual components, wherein the delivery end below the piston is connected with the discharge fitting (2) and the stock container (4).
12. Apparatus according to Claim 11, characterized in that the feed conduits (36, 37) to the stock container (4) and to the discharge fitting (2) are each equipped with check valves (40, 41) which close the discharge fitting (2) during the suction stroke of the piston (35) and close the feed conduit (37) to the stock container (4) during the compression stroke of the piston (35).
13. Apparatus according to Claim 11 or 12, characterized in that the metering cylinder (34) is arranged on the back side of the support wall (1) and linkage elements (43, 44) connect the piston (35) and the handle (2).
14. Apparatus according to one of Claims 11 through 13, characterized in that a swivelable tube (47) is provided between the feed conduit (37) to the metering cylinder (34) and a connecting adapter (48) for the stock container (4), so as to make it possible for the connecting

adapter (48) to swivel by at least 180°.

15. Apparatus according to Claim 14, characterized in that adapters are provided in order to connect stock containers with wide openings, such as creme cans or the like, to the connecting adapters (48).
16. Apparatus according to one of Claims 11 through 15, characterized by the presence of a bolt-shaped stop pin (49) whose height relative to the handle (2) can be adjusted and which limits the stroke movement of the handle (2) and thus the suction stroke movement of the piston (35) in the metering cylinder (34).
17. Apparatus according to one of Claims 11 through 16, characterized in that the handle (2) [sic] is arranged on a pivotable arm (43) which is connected, via an intermediate lever (44), with the upper end (45a) of the piston rod (45) of the piston (35) in the metering cylinder (34).
18. Apparatus according to Claim 17, characterized in that the rearward free end of the arm (43) forms a trigger for actuating a limit switch (46) for a totalizer or a computer (8, 52).
19. Apparatus according to one of the preceding claims, characterized by a stepping mechanism (23, 24) that moves the piston (18) stepwise in the stock container (4) by specific constant displacements when pressure is applied to the handle.
20. Apparatus according to Claim 19, characterized in that the stepping mechanism is designed as a rack (23) with a ratchet (24) wherein the

rack (23) forms an extension of the piston rod (22).

21. Apparatus according to Claim 20, characterized in that the ratchet (24) is positioned at the free end of a toggle joint (19) that can be moved by the handle (3).
22. Apparatus according to Claim 19, characterized in that the stop pin (49) can be adjusted by means of a stepping mechanism.
23. Apparatus according to one of the preceding claims, characterized in that the linkage elements (11) between the handle (3) and the piston (18) are designed as toggle joint mechanisms (19) that are associated with the stepping mechanism (23, 24).
24. Apparatus according to one of Claims 1 through 18, characterized in that the piston (18, 35) is actuated by a servomotor that can be triggered by means of the handle (3).
25. Apparatus according to Claim 24, characterized by the presence of a time switch mechanism that enables changes in the duration of operation of the servomotor and thus the stroke of the piston in order thereby to adjust the delivery quantity.
26. Apparatus according to one of the preceding claims, characterized by the presence of a totalizer (53)-equipped computer (52) that is driven by individual pulses, wherein a preselectable price has been assigned to each individual pulse.

27. Apparatus according to Claim 26, characterized in that the price for each component can be preselected by an adjustment device (51), which is associated with each stock container (4), wherein said preselection is carried out electrically or electronically.
28. Apparatus according to Claim 27, characterized in that the adjustment devices (51) are provided with scales calibrated in units of monetary currency (54) and are placed on the back side of the support wall (1).
29. Apparatus according to one of Claims 26 through 28, characterized by the presence of a contact, preferably in the form of a limit switch (46), that is acted upon at the end of the stroke of the handle (3) or of a linkage element (11, 43) connected to the handle.
30. Apparatus according to one of the preceding claims, characterized in that the support wall (1) is attached to a work table (5).
31. Apparatus according to Claim 30, characterized in that the work table (5) is designed as a lower shelf to hold additional packaging containers and/or stock containers.
32. Apparatus according to Claim 30 or 31, characterized in that a rear cabinet, in which other supply compartments are placed, adjoins the back side of the support wall (1).
33. Apparatus according to Claim 32, characterized in that the rear cabinet is designed as a closed, walk-in closet (15), which is provided

with a side door (14).

34. Apparatus according to Claim 32 or 33, characterized in that shelf boards (16) are placed on at least one side wall.
35. Apparatus according to Claim 34, characterized in that other shelf boards are placed below the stock containers (4) on the back side of the support wall (1).

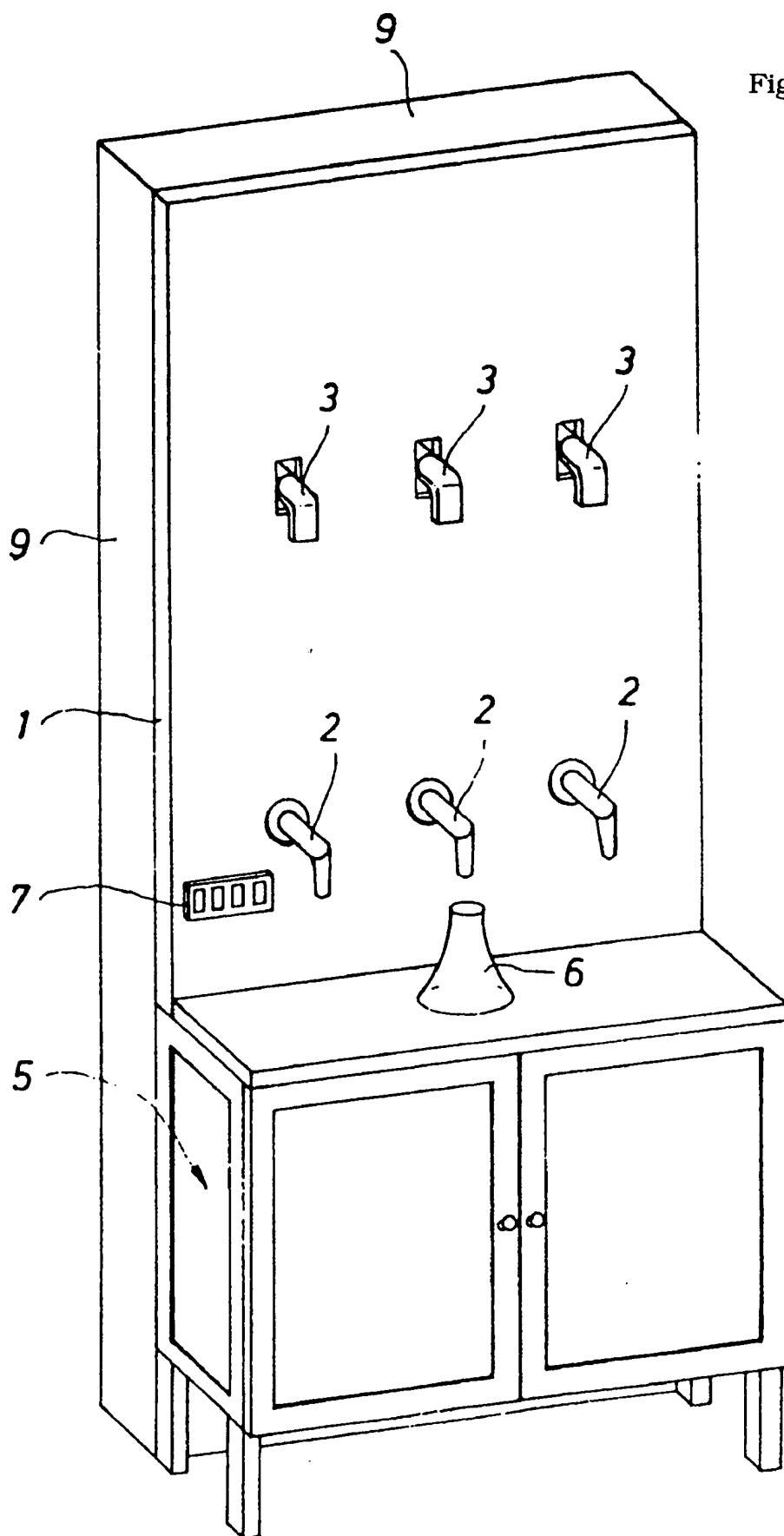


Figure 1.

Figure 2.

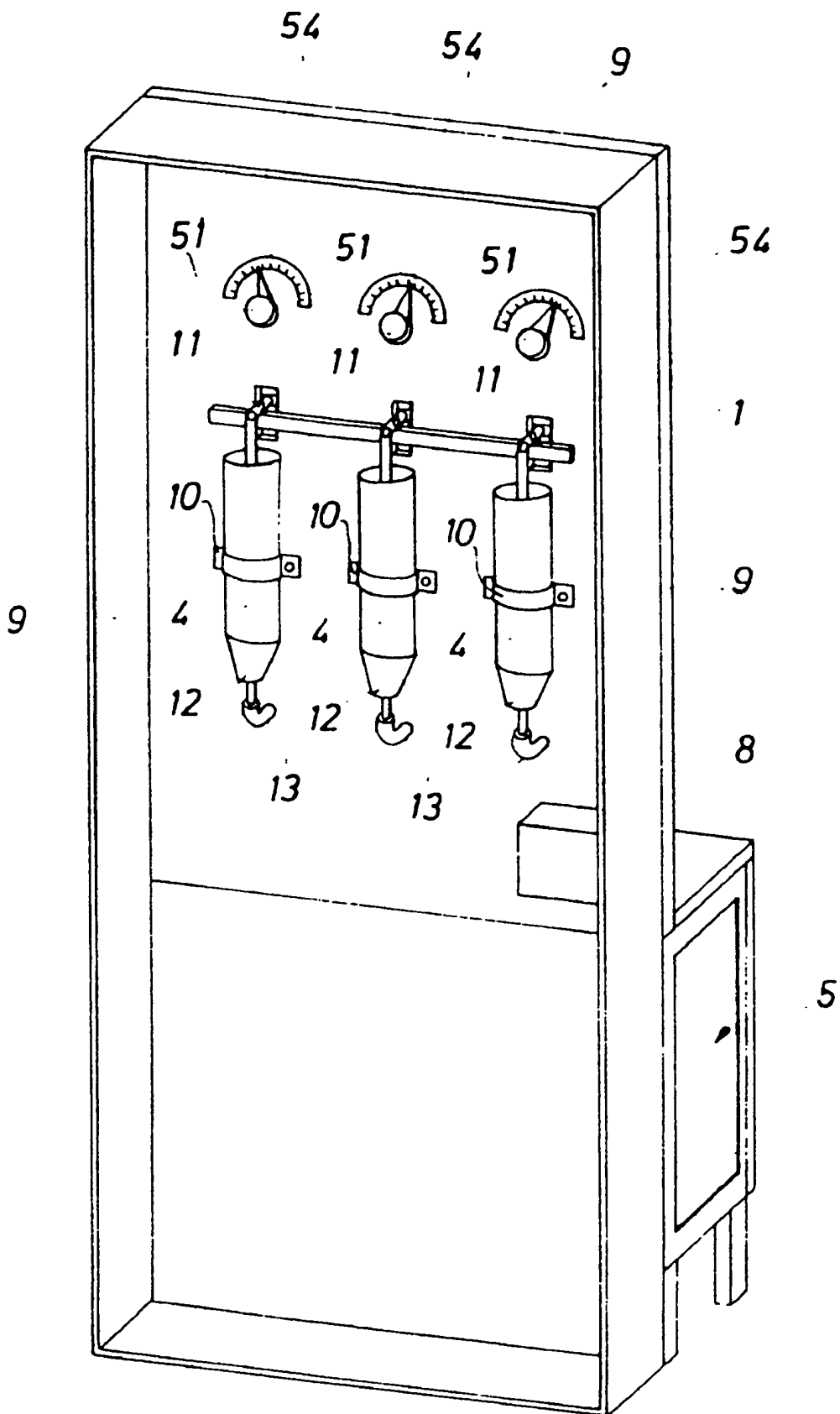


Figure 3.

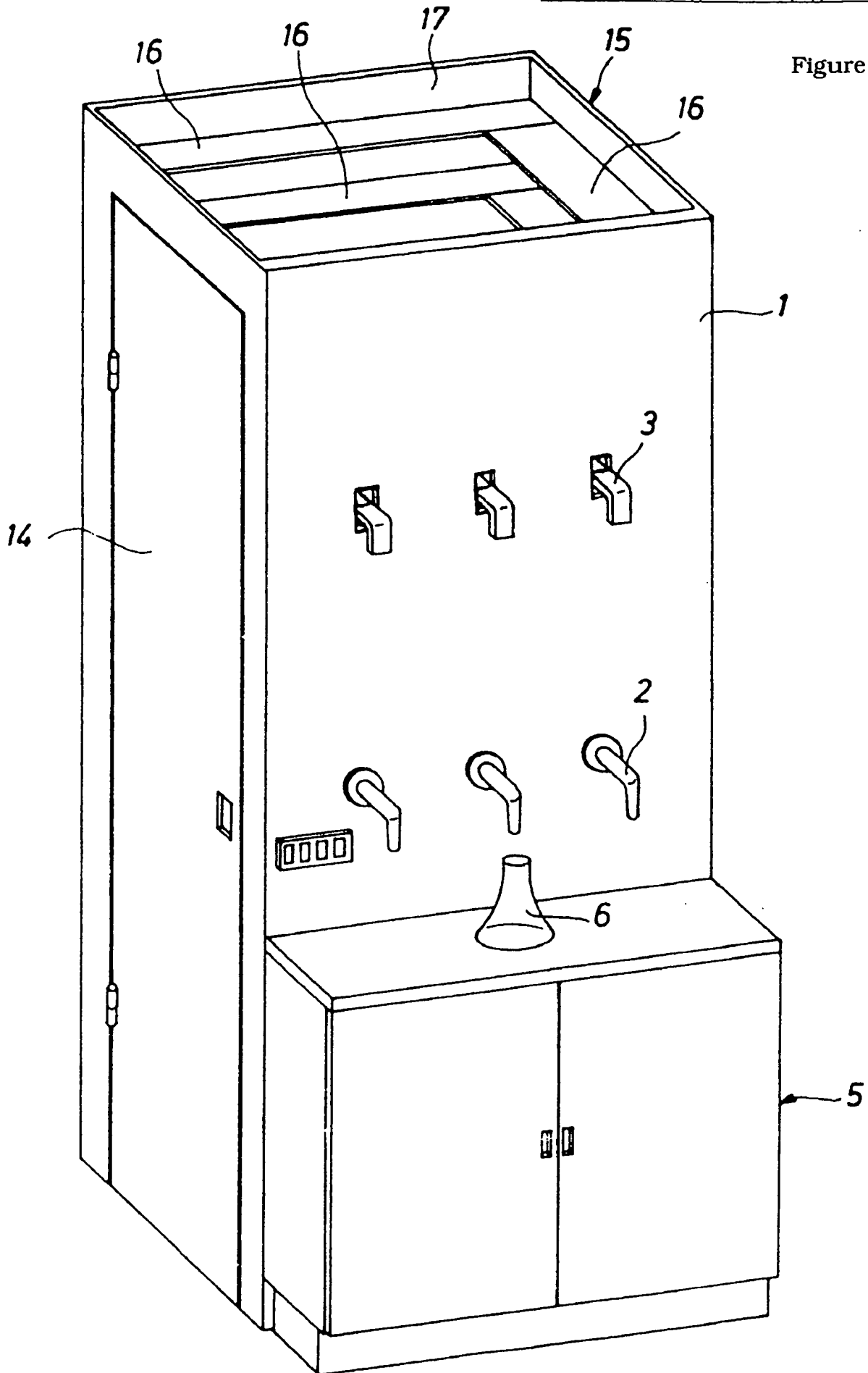


Figure 4.

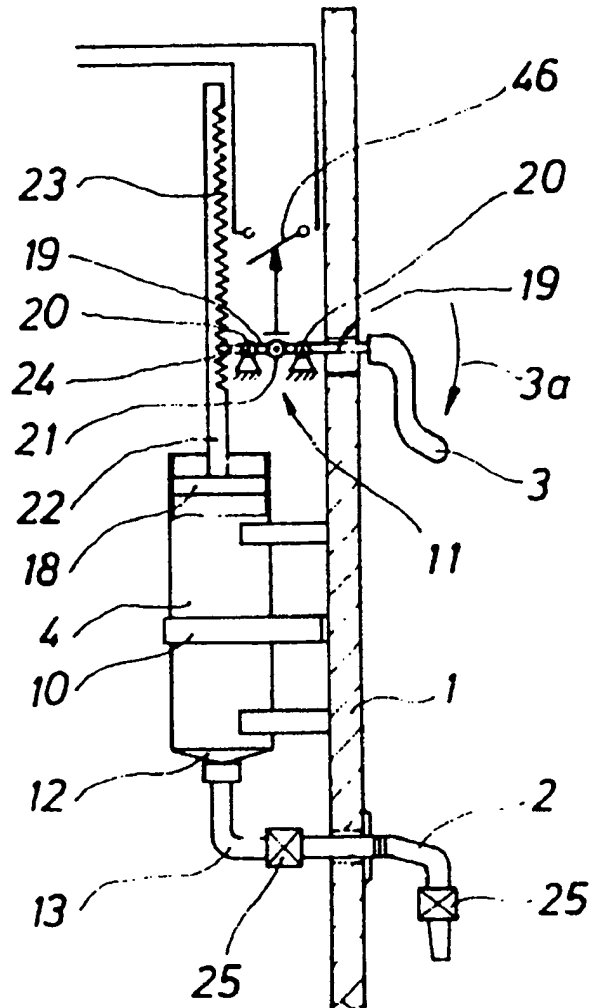


Figure 6.

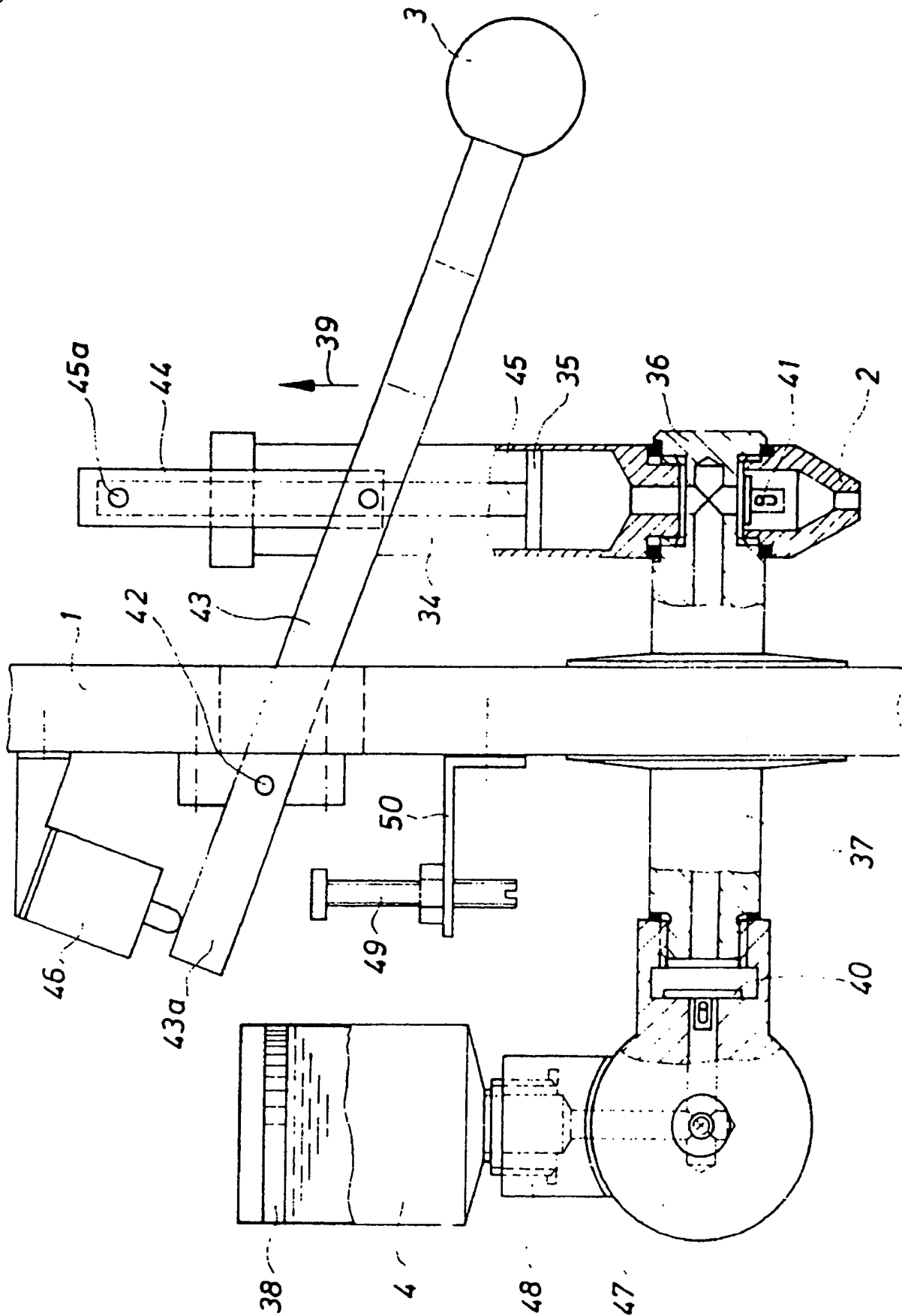


Fig. 7

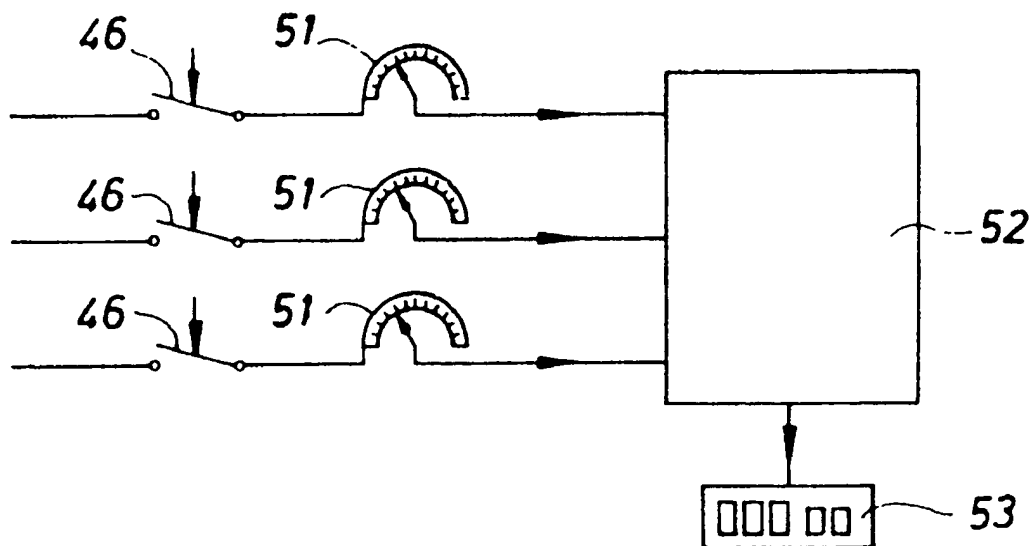


Fig. 8

